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# Modelling competing contextual rules: Conflict resolution in Punjab, Pakistan

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## Abstract

This paper addresses ways of modelling Punjabi conflict resolution strategies. The model produced will be used to develop simulation software of conflict resolution procedures in Punjab, Pakistan. Anthropologists in Pakistan and South Asia have long sought ways of dealing with the seeming contradictions of collective explanations of behaviour and the impact of individual behaviour [see especially Ahmed 1980; Barth 1959; Leach 1954; for a more recent and less regionally specific discussion of the problem see Aunger 1995]. Part of the explanation of this dilemma lay in the presence of competing social structures from which individuals decide on courses of action. The individual in South Asia is constrained by the collective in many respects, yet the collective has at its disposal competing sets of social rules or structures from which the individual may draw strategies and values. Thus it is not a contradiction to say that there is little room for individual action in Pakistan and to simultaneously to recognise that individual action is a determining factor for social phenomenon. Individuals are able to manipulate parallel and even contradictory sets of values and strategies which allow them to conform to collective expectations. The sketch of a model design in this paper presents some of the reasons why it is desirable to render social context or environment more complex, as well as offering some broad description of how one would begin to do so.

## 1. Modelling social phenomena

Most social modelling has been concerned with aggregated agents. A more recent focus has been constructing intelligent disaggregated agents who can not only interact in realistic ways but also evolve in realistic ways. The context or environment has not tended to receive nearly as much focus as the agent. Radical multi-agent modellers would, of course, disprove this generalisation. For radical multi-agent modellers every aspect of the model is represented as an agent. As far as modelling human social systems, however, the radical multi-agent modellers have not yet had a significant impact, perhaps for good reason. It is not by any

means, always desirable to construct each variable in a model as a complex agent, in any case it is difficult.

### 1.0.1. Bargaining model

Thoyer et al. [2001] developed a bargaining model to simulate negotiations between water users in France. Their goal was to create tools to guide the negotiation process in the wake of the French water law of 1992, which requires collective and local negotiation of water regulations. Water regulations must be negotiated in each river sub-basin. The model employs aggregate 'players', seven negotiation variables and an estimate of farmers' utility functions based on hydraulic and economic models.

There are problematic assumptions in this model if we seek to apply it even partially to the task of studying Punjabi conflict negotiations:

1. perfect information distributed across all participants
2. each 'round' outcome determined by the sum of the player's utilities derived from each player's proposals in the next round weighted by the access probability
3. a lack of alternative arenas in which to conduct negotiations

First, Thoyer et al. acknowledge that perfect distribution of information is not characteristic of real life situations but introduce this assumption for the purposes of their model. It is sometimes necessary to introduce model assumptions that are clearly not viable, particularly when one is first investigating basic properties. To the extent that the model so hobbled can account for phenomena we can claim some greater understanding. However, the presence of these unmet assumptions can make a model very difficult to use directly in either a descriptive or analytic capacity and we often lack tools to establish the consequences of failure to satisfy assumptions.

In any case it is clearly desirable that the model should in fact reflect differentiated access to information. Different agents have different pools of knowledge (including access to other people's knowledge) as well as different objectives for what they want to do with that knowledge.

Second, in the model proposed by Thoyer et al. the game moves on to the next round by players refusing to come to a compromise. The players decisions are weighted by their access probability, which should in theory allow more powerful players to impose compromises simply by virtue of their ability to reduce the access probability of other player's proposals. Nevertheless this basic mechanism for

advancing or ending the game demands unrealistically high levels of empowerment distribution among all players. In order to model Punjabi conflict arbitration one must contend with the differences in status, authority and power between potential participants. In addition to the disputants one must include the arbiters and other related individuals in the model. It may be that the formal disputants are relatively equal (which is in fact often the case), however their case impacts on a wider range of people than themselves and those people will be allowed some influence in the proceedings.

Third, Thoyer et al. have modelled a particular real life situation in which the French state has established certain procedures for negotiating competing interests in semi-limited resources. They are concerned with creating tools for understanding that particular arena more fully. Consequently the model is not so much an attempt to simulate the entire procedure of settling water access allocations but rather to model the formal, state sponsored, part of that process. One might also profitably include competing arenas or contexts in this case if, for example, some players held additional meetings with influential people not formally involved in the process of water negotiations.

### 1.1 Multi-agent modelling.

Multi-agent modelling systems is an attempt to construct simulated entities who may have conflicting objectives. They may have access to different resources and different knowledge pools. Individual agents can be assigned different status, authority and power definitions at the outset of the simulation and they can be given access to the tools required to modify those positions. While this is a different kind of analysis than the game-theory bargaining model of Thoyer et al. much multi-agent modelling does not define context or environment in the same complexity as agents. The context is embedded within the agents (albeit different aspects of the context may be embedded), however, I seek to model contexts which may be as complex as agents. To this end it is useful to follow the more radical MA systems modellers who construct all variables as agents. That is to say that the environment, or context, is itself made up of an agent or agents which interact with each other as well as other agents. Most agent modelling is based on the notion of doing a materialist model, including the environment. But there is only one of each. Structures and processes are supposed to be emergent behaviour of these systems. Where knowledge is a part of the system, each agent has their own knowledge. The materialist model presumes a common material set of 'things' which individual agents may interpret differently, either by paying attention to specific details over others, or based on knowledge which is not itself a part of the material context (but may instead be rules that were induced over previous encounters).

Edmonds [2001] says there are multiple goals of multi-agent based simulations (MABS). MABS may serve as entertainment, art or illustration, in which case real life complexity may be unnecessary. They may also serve as tools for communication or science. If models and simulations are to serve as tools for communication, it may also prove necessary to reduce the complexity to the extent that the model is not a viable representation of the phenomenon

(but which nonetheless serves to communicate certain aspects of the phenomenon). If the purpose of the tool is to clarify aspects of observed behaviour then, again, it is probably desirable to reduce many of the variables to simple aggregates of expected entities. Since the interest of anthropologists is by and large, people over environment (even when they call themselves environmental anthropologists the primary interest often remains people) it is understandable that social models have placed their energies in creating more intelligent active agents representing people, rather than more complex agents representing environmental or contextual variables. One promising option currently being pursued by Fischer [personal communication] is to design simulation software which outputs XML streams of data which may be aggregated or disaggregated depending on the specific research issues.

For my purposes, an increased level of contextual complexity has become unavoidable. Active agents representing people, should have the capacity to respond to emergent contextual structures but those structures must be plural and simultaneous. The model assumes the presence of competing sets of values and strategies as part of the context.

## 2. Modelling Context/Environment

There are numerous ways to model the context or environment. The differences emerge from the research questions. It may be necessary to construct a reductionist model of social context to address some specific issues and this may aid in understanding more complex situations. Necessarily, simpler models of context are unavoidable during the developmental stage of a project. Simpler models become more complex as understanding increases. Crudely speaking, there are four choices of how to construct the context/environment in a model:

1. single static structure (a fixed set of rules throughout the duration of the model)
2. single evolving structure (a fixed set of rules at the outset but which can change through the duration of the model)
3. multiple (competing) static structures (more than one set of fixed rules throughout the duration of the model)
4. multiple (competing) evolving structures (more than one set of fixed rules at the outset all of which can change throughout the duration of the model)
5. combinations of the above

Clearly the production of a single structure must precede the production of multiple structures and this should generate certain insights by itself. The issues with which I am concerned however, require something beyond either of the first two options. I do not necessarily require multiple evolving structures, though that should prove more important as I expand my research questions to address the changes that have occurred in Punjabi conflict resolution over the past 50-60 years.

### 2.1 Complex agents interacting with complex contexts.

The basic assumptions which underlie the design of the models proposed in this paper are as follows:

1. there are socially constructed contexts which offer agents contradictory sets of values and strategies

2. agents manipulate contextual strategies available based on their access to knowledge and their objective in the given instance
3. no two individuals have exactly the same access to knowledge nor are their objectives identical
4. 'interested' agents may not formally be a part of the dispute resolution process at all, yet they may be critical to explanations of predictions of the outcomes.

Different modelling strategies touch on some of these assumptions/requirements but they do not address them all. In part, the model should reflect an 'unjust' version of 'justice'. Partiality of arbiters should be built in to the process. Arbiters at all levels are interested agents who have their own objectives which may or may not be compatible with the objectives of disputants or indeed of some normative expectations of the arbiter's role. This design accepts that some individuals may force compromise more easily than others but that acceptance of compromise does not mean compliance with that compromise. A simulation based on the model would not therefore 'end' when a compromise had been agreed. It would rather pursue the dispute to identify ways in which agents might circumvent agreements. In the event that agreements are not respected then the model and subsequent simulation should provide clues as to the aspects of conflict resolution agreements most vulnerable to 'violation'.

### 3. Complex contexts

Legal pluralism has long been a feature of South Asian society. The formal legal system of Pakistan came out of the Islamic legal tradition<sup>1</sup> (as practised in South Asia under the Moghuls) and the British legal tradition<sup>2</sup> (as practised in the colonies). Since independence Pakistan has attempted to rid itself of customary law, in so far as the formal courts are concerned. The state's attempts at judicial reform<sup>3</sup> of the legal tradition notwithstanding, Pakistani courts remain confusing and intimidating. The state has implemented *shari'at* to govern domestic law. *Shari'at*, which began as a pragmatic attempt to cross cut indigenous loyalties both in Arabia and the peripheries of the Islamic world, today may be seen as a viable modernist legal code. The Pakistani state's adoption of the *shari'at* and British legal systems has left little room for customary law in the formal court system of Pakistan today. Effectively the only decisions that may be based on custom are those of the arbitration councils in the rural areas. Decisions based on customary law become problematic in urban situations where populations have come from a dozen or more different sub-cultures, each with its own customary law. The lack of uniformity between customary laws of different regions (even within one province) has served to undermine these traditional judicial systems in areas of intensive migration.

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1. Islamic law was introduced in South Asia in the early 8th century and enjoyed varying degrees of application/enforcement [Pearl 1987: 20-21, Schacht and Bosworth 1979]. Islamic law was an attempt to replace tribal loyalties and affiliations with Islamic community loyalties and affiliations [Gilmartin 1988: 43-44]. In the early part of the Islamic era adjudication was to some extent an *ad hoc* affair trying to cope with problems as they arose among the newly formed Muslim community [Pearl 1987, Schacht and Bosworth 1979].

Nevertheless, traditional justice in the villages remains common.

Traditional conflict resolution systems resemble legal systems described by Gluckman [1957] in Barotse land. Presumptions of judicial impartiality are noticeably absent in both cases. Adjudicators take into account facts that are not presented in formal hearings. The inclusion of individuals not directly related to the case is perceived to render the proceedings more 'just'. Elsewhere I argue that the goal of traditional arbitration in Punjab is more accurately described as conflict deferment than conflict resolution [Lyon 2001]. That is, people intervene when conflicts threaten community relations and that intercession is geared towards eliminating threats to that harmony rather than achieving individual redressal of wrongs.

The legal tradition of Pakistan since independence is an attempt to create a system based on precedent which may act as guide in the judicial process. It has formal pretensions to neutrality which are not always achievable but are at least present. Decisions in Punjabi arbitration have a very different goal that is similar with the origins of the *shari'at* in Arabia and its application during the expansion of Islam but incompatible with what *shari'at* has become. Its goal is to facilitate a particular set of normative behaviours within the community by preventing excessive disruption to groups and it may achieve this goal through partiality and pragmatism without fear of setting future precedent.

### 4. Modelling/simulating a real life conflict

The following case study illustrates many of the complexities of contexts and agents. It involves a child custody case which was confusing to the participants as well as uninvolved observers. In Islam children are considered to belong to their father's family and religion. In cases of death or divorce fathers are deemed in all cases to be the guardian of their children, however, young children may remain in the care of the mother. The age at which children may be separated from their mother differs by sect from two-seven years and by custom often older (mid teens). The person caring for the child must be 'sane, trustworthy and of good morals' [Pearl 1988: 92]. If either parent is determined to be morally unfit to care for the children then they may lose guardianship rights. This may result in children being left with other paternal relatives. The following case demonstrates the way that individuals in real life (and agents in simulations) can invoke multiple social value sets for contradictory purposes. A model of this case requires that agents be capable of deception and have access to multiple shifting value sets. As one value set fails to deliver the desired result then the agent should have a mechanism for shifting to another.

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2. The British gave statutory recognition to custom in the Punjab Laws Act (1872). British administrators felt it preferable to root their legal presence in indigenous kin based rules rather than religiously based rules.

3. See Pearl [1987] for a more complete discussion of successive Pakistani governments' attempts to dismantle traditional law and impose Islamic law.

#### 4.1 Child custody case

Abdul's wife died leaving behind a two year old daughter. Following local Islamic Bareilvi funerary custom, Abdul and his relatives were in a state of semi-public mourning for 40 days following the woman's death. During this time Abdul left his two year old daughter in the care of his deceased wife's parents in the nearby city of Taxila. Upon completion of the 40 days mourning period he sent word that he was ready to take his daughter back. His parents-in-law refused him access to the child. Abdul first asked his elder male relatives to intercede on his behalf but this was unsuccessful. He and his father then turned to one of the landlords in their village. The selection of landlord was based on previous familial connections with the landlord's father. The landlord, Malik Nawab, listened to their version of events and then requested that a member of the deceased wife's family come to the village to provide their version. The brother of the woman came to the village and accused Abdul of being a bad husband, a drug user and an alcohol drinker. Malik Nawab was not prepared to comment on Abdul's qualities as a husband but categorically rejected the suggestion that Abdul was either a drug user or an alcohol drinker. Malik Nawab then decided that the case needed an arbiter of more experience and influence and so referred the case to his maternal uncle, Malik Hafiz, who was a retired police officer and well connected landlord in the region. Malik Hafiz then invited several respected sharecroppers of both himself and Malik Nawab to form a *jirga* (customary dispute resolution council). The membership of the *jirga* was accepted by both sides of the dispute. After much travelling back and forth between the village and Taxila, they announced that the disputants had reached an agreement. The grandparents would return the little girl and Abdul would return the dowry. Abdul returned part of the dowry and demanded his daughter before returning the rest. The grandparents refused to return the little girl until all the dowry had been returned. Abdul and his family then decided to take the matter to the state courts of Pakistan in the hopes that if the court found in their favour the grandparents would have no choice but to comply with a state court order.

This case could be seen as an outright failure of arbitration however it did provide a 'cooling off' period for the father and his family. In the initial stages of that case the potential for violence was high in spite of the fact that neither side had a history of violence. The issue was extremely serious and potentially threatening to the local community. From the point of view of Abdul's village his choice to pursue the matter in the state courts was less disruptive than had he attempted to kidnap the child or resort to physical violence. Arbitration eased tensions but did not eliminate them. This case was locally seen as a failure to achieve a just result. If recovery of the little girl had truly been the goal of the arbiters, however, they might have accomplished it.

A special relationship exists between police and local elites in Pakistan. In rural areas police are acutely aware of the position that local elites hold. In the area police present

themselves to local landlords to declare their intention of arresting someone in the village. The landlord either tells them he has no problem with the individual in question being arrested or he would prefer the police let him handle the matter himself. The police are aware that prisons and jails are bad places to put delinquents. Young men who have too much time on their hands may learn lifelong patterns of criminality in prison. If a landlord decides to take an interest in someone, he can effectively control their behaviour by providing them work. If a landlord tells the police not to arrest someone then generally what he is saying is that he himself will provide the man with an activity which prevents him from wrongdoing and will assume the role of punisher if the need arises. The police have also been used in the area to enforce illegal landlord interests (such as the repossession of land redistributed under Ayub Khan and Zulfikar Bhutto).

Given that the landlords in the area and the police have such an intimate relationship Malik Hafiz might have asked the police to help enforce his decision. The deceased mother's parents had no evidence that Abdul was an unfit father. Even if they had shari'at would still have proscribed that the daughter be placed with someone in Abdul's family, not her maternal family. Had Malik Hafiz opted for this action then the level of negotiation would have been between Malik Hafiz and Abdul's parents-in-law's patrons. Malik Hafiz would have had to persuade the patrons of the grandparents that his actions were just and merited police intervention. To my knowledge Malik Hafiz never considered turning to the police or anyone above the level of Abdul and his parents-in-law, in any event he did not do so if he did consider it. The implication is clear-- their priority was not the fate of the child nor Abdul. They became involved because one of their clients was in a position in which his *izzat*<sup>4</sup> was being threatened. Had the situation turned violent the police would have become involved and Abdul might have found himself in serious trouble. The goal of the arbiters was the resumption of normative (i.e. non-disruptive) behaviour on the part of Abdul and his closest relatives.

#### 4.2 Agents and interactions

In order to model this case one needs to define the agents as indicated in Table 0-1 below. Clearly there are a great many more agents which might be usefully disaggregated from the above set, however, this set of agents provides a critical set of agents for explanatory and predictive models.

Disputant Agents (DA), Arbiter Agents (AA) and Interested Agents (IA) should conform to the Read and Fischer [2000] type 'E' agents:

agents respond to emergent structures and modify/change aspects of an underlying conceptual system that influences the progress of the response and future initial responses.

These are active agents in that they choose courses of action and select which agents are necessary to bring about

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4. Loosely translated this may be understood as honour. This is different from Mediterranean honour, however, (e.g. Pitt-Rivers 1965; Davis 1977; Stewart 1994). An individual's *izzat* as the measure of their ability to control themselves, their family, and other people.

desired results. They seek to engage the resources of other agents on their own behalf. They may contradict 'true' statements if that serves the needs of their specific goals. They may equally modify their course of action if it appears that they will not achieve desirable results.

Context Agents (CA) are an attempt to render the underlying conceptual systems as agents. They are, in effect, agents whose parameters include a reified set of values, approved strategies, neutral strategies and disapproved strategies. Parameters of different CA's need not be compatible with each other. Like the more conventional DA, AA and IA, these special agents should be capable of modification as a result of interactions, yet these are passive modifications which are the result of interaction, not the result of goal oriented decision making.

One important difference between DA, AA, IA on the one hand, and CA on the other, is that CA do not 'violate' their own set of values or rules and they are not capable of deception. They are passive agents which other agents tap into in order to deal with particular situations. While they can be modified, they cannot lie. All parameters of CA are 'true' (even though they may also appear to include contradictions). The active agents, contrarily, are capable of deception. They interact with the CA's but where the CA appears to be inadequate to resolve issues to the agent's satisfaction, the agent may choose to try and 'break' the rules or lie about his or her situation. Non-CA agents can, therefore, misrepresent their own parameters in ways that CA cannot (remember that CA do not 'represent' themselves but are rather utilised by other agents for their purposes).

At the level of interaction between agents, the model conforms to the Read and Fischer [2000] type 'e' modality of interaction:

models in which the syntactic structure is not fixed but may change in accordance with conditions that arise in the external-material and/or internal-ideational domains; e.g., change in the form of social structure or of a kinship terminology (cf. Read 1987).

From the outset of the model competing syntactic structures are formally defined as part of the system. At the start of the model, the CA represent a normative set of competing syntactic structures which other agents will employ to achieve contradictory goals. As the model progresses, not only do agents selectively employ the competing syntactic structures but also the syntactic structures themselves become open to modification as a result of agent interaction. The starting point of CA includes certain values and strategies which are necessarily resistant to some kinds of modification, however, they should reflect real human contexts

and be open to some kinds of change as the interaction with different agents progresses.

Finally, agents do not all have equal access to each other. Thus, while one would expect most Punjabis to have access to the Kinship resolution CA this implies that the agent has a kinship group available within a reasonable distance. There are agents who do not have access to such strategies because they lack the appropriate kin networks within the geographical area. Similarly, an agent must have access to a landlord in order to employ the Landlord intervention CA. Within the set of agents who do have access to that particular CA, there should be differential access to the full range of values and strategies. Thus in the case study I have provided, Malik Nawab did not feel he had complete enough access to the full range of strategies necessary to resolve the issue, and so turned to another landlord/agent who he believed had greater access to the range of strategies. Agents know of the existence of each other but they are not privy to a wide enough range of the parameters or contents of each other to utilise all other agents equally well. The model is predicated on an assumption of distributed and unequal access to knowledge, networks and abilities.

## 5. Multi-agent, multi-strategy, multi-value set modelling.

Environment may be modelled as one or more agents. The value sets that agents draw on may seem incompatible and contradictory, nevertheless, in real life situations they co-exist. Perhaps they co-exist in real life so readily because they are contradictory. Information theory would support this proposition. Information theory recognises the importance of message variability. If the message variability is too low then while predictability is high, the message may only deal with a narrow range of circumstances. Conversely, if message variability is too high, then predictability is low and no situation can be dealt with well. In an uncertain world it is necessary to have some degree of both message variability together with some limits on that variability. This context suggests that one can either have a very elaborate single value system that will perform well in most circumstances, or a lot of less elaborate value systems, each of which applies well to some version of the world. It may also in some cases be necessary to carry multiple sets simultaneously in order to deal with multiple parties.

In Pakistan, where there is little bureaucratic or state stability, contradictory value sets prove extremely useful as weapons of resistance against the arbitrariness of shifting governments and bureaucrats. Likewise, the strategies at the individuals' disposal offer plural possibilities which can be accessed for different reasons. Finally, the intervention or

**Table 0-1. Agents**

Disputant Agents (DA)	Arbiter Agents (AA)	Interested Agents (IA)	Context Agents (CA)
Abdul	Abdul's Father	Abdul's extended patrilineage	<b>Kinship resolution</b>
Abdul's parents-in-law	Malik Nawab	Abdul's parents-in-law's Taxila patrons	<b>Landlord intervention</b>
Abdul's brother-in-law	Malik Hafiz	Police	<b>Jirga hearings/negotiations</b>
Abdul's father	Individual Sharecroppers	Villagers	<b>State Court system</b>

influence of uninvolved agents is tremendously significant in the Pakistani Punjab. In the case study it became quite clear through the course of the negotiations that the arbiters had a very clear agenda which had very little to do with the fate of the child or either disputing party. Their objective involved a value set which placed the collective good as a higher priority than individual needs. I did not have sufficient space to discuss other uninvolved individuals, however, there were others who were similarly 'interested' and had an impact on the proceedings.

The purpose of modelling and simulation is to render complex systems into representations which can be analysed. This may, and often does, involve simplification and generalisation, however, this should be done when there is a valid analytical need to do so. In the case of Punjabi conflict resolution not only is there not a valid analytical need to reduce the complexity of the context but there are very valid analytical reasons not to do so.

In the case of Punjabi conflict resolution it is clear that models should reflect not only the responsiveness of agents to emergent syntactic structures, but also to competing extant syntactic structures. The model assumes a real life scenario in which there are a plurality of values and strategies available to agents. It also assumes that those values and strategies can be modified to some extent and that when that occurs, the agents must modify their interaction as well as their own parameters.

The purpose of this paper is not to suggest that other types of models have no value. Different models serve different purposes. The research questions which I have posed require a particular type of model which can cope with competing contextual structures in more agent like ways. To be sure, they constitute a special type of agent but, like agents they must have individualised parameters which inform interactions between other agents and which may have the capacity for modification as a result of interaction. Other ways of modelling context do not serve my purposes for these research questions, yet they can and do help us deal with other kinds of research questions.

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